

JAPANESE

[JP,11-187454,A]

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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE  
INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

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CLAIMS

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[Claim(s)]

[Claim 1] Personal digital assistant equipment characterized by having the processing section reported after detecting the communication link outside of the circle and a communication link within the circle, communicating with said base station automatically in the personal digital assistant equipment which has the function which carries and communicates through a base station and displaying this communication link result.

[Claim 2] It is personal digital assistant equipment characterized by having the processing section reported after displaying that when it moves to a communication link within the circle from the communication link outside of the circle, and it communicates with the timed-recording function of said base station automatically and said timed-recording function has a message in the personal digital assistant equipment which has the function which carries and communicates through a base station.

[Claim 3] The information of a purport with said message is personal digital assistant equipment according to claim 2 constituted so that it may be carried out, when it does not communicate with the timed-recording function of said base station, and hand control in the predetermined time after displaying a purport with said message.

[Claim 4] In the personal digital assistant equipment which has the function which carries and communicates through a base station By the detection result of the detecting element which detects the communication link outside of the circle and a communication link within the circle, and said detecting element Personal digital assistant equipment characterized by having the measurement section which starts measurement of predetermined time, and the information section which reports the communication link result of said communications department after said predetermined time progress by the communication link result of the communications department which communicates with said base station automatically, the display which displays the communication link result of said communications department, and said communications department.

[Claim 5] In the personal digital assistant equipment which has the function which carries and communicates through a base station When it moves to a communication link within the circle from the communication link outside of the circle by the detection result of the detecting element which detects the communication link outside of the circle and a communication link within the circle, and said detecting element By the communication link result of the communications department which communicates with the timed-recording function of said base station automatically, and said communications department, when said timed-recording function has a message By the communication link result of the display which displays that, and said communications department, when said timed-recording function has a message It is personal digital assistant equipment characterized by having the information section which reports a purport with said message when it does not communicate with the measurement section which starts measurement of predetermined time with the timed-recording function of said base station, and hand control in said predetermined time.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to personal digital assistant equipment for a user to carry and communicate.

[0002]

[Description of the Prior Art] In recent years, personal digital assistant equipments, such as a cellular phone (pocket mold telephone) and PHS (simple pocket mold telephone), have been used abundantly. Generally such personal digital assistant equipment is a case with the configuration that a control section, the transceiver section, a display, the sound I/O section, a control unit, etc. have been arranged.

[0003] When communicating between [ of such a configuration ] personal digital assistant equipment, first, a transmitting person pushes the call number of an addressee's personal digital assistant equipment (henceforth the 2nd personal digital assistant equipment) for example, by the number key of the control unit of the personal digital assistant equipment (henceforth the 1st personal digital assistant equipment), and presses a communication link initiation key.

[0004] Then, while the call number is displayed on a display, signal transmission is transmitted to a nearby base station and the nearby mobile communication exchange (only henceforth a base station) through the transceiver section from a control section. And the signal transmission received in the nearby base station is transmitted to the transceiver section of the 2nd personal digital assistant equipment. The signal transmission received in the transceiver section of the 2nd personal digital assistant equipment is sent out to a control section, and a ring tone is emitted from the loudspeaker of the sound I/O section.

[0005] If the ring tone from a microphone is heard, an addressee will press the communication link initiation key of the control unit of the 2nd personal digital assistant equipment, and will answer toward the microphone of the sound I/O section. Then, the signal transmission by this response is transmitted to a nearby base station through the transceiver section from a control section. And the signal transmission received in the nearby base station is transmitted to the transceiver section of the 1st personal digital assistant equipment. The signal transmission received in the transceiver section of the 1st personal digital assistant equipment is sent out to a control section, and voice is uttered from the loudspeaker of the sound I/O section. A communication link becomes possible between the 1st and 2nd personal digital assistant equipment henceforth [ this ].

[0006] By the way, various service functions, such as for example, answering machine service, call-waiting service, and a call forwarding service, can be set now to personal digital assistant equipment. the time of answering machine service being put on the communication link outside of the circle in a high-speed migration car etc., when the location which an electric wave does not reach [ the 2nd personal digital assistant equipment ], for example, personal digital assistant equipment, is a cellular phone and the inside of an underground center or a subway and personal digital assistant equipment are PHS -- the timed-recording function of a base station -- the 2nd personal digital assistant equipment -- replacing -- the sending signal from the 1st personal digital assistant equipment -- winning popularity -- a predetermined message (for example, --

"— this is \*\*\* watch.) Now, it cannot appear in a telephone. please record an identifier, the telephone number, and a message after dial tone. " -- it is the service transmitted to the 1st personal digital assistant equipment.

[0007] Even if such answering machine service is set as the 2nd personal digital assistant equipment, however, conventionally When a communication link is from a transmitting person while the addressee had come out from a communication link within the circle to the communication link outside of the circle, for example, an addressee Even if it returned to a communication link within the circle after that, he may not notice what answering machine service was used for by the transmitting person, and the existence of a message needed to be asked to the timed-recording function of a base station by manual access from the 1st personal digital assistant equipment each time.

[0008] Then, the receiver which outputs communication link outside-of-the-circle information to personal digital assistant equipment from an input signal, A means to detect having been in the communication link outside of the circle the timer which sets a communication link outside-of-the-circle period as arbitration, and beyond the period set up by the timer based on the communication link outside-of-the-circle information on a receiver, and having returned to a communication link within the circle after that, In order to access the timed-recording function of a means to generate warning based on this detection result, and a base station, when it has a means to drive a transmitter, an addressee once comes out from a communication link within the circle to the communication link outside of the circle and it has returned to a communication link within the circle after that The personal digital assistant equipment which can carry out automatic access is proposed by warning generating and the timed-recording function (refer to JP,9-46760,A).

[0009] According to such personal digital assistant equipment, even if timed recording of the message is carried out while an addressee comes out of between the communication link outside of the circle and communication link within the circle or enters without consciousness, after being left for a long period of time, without noticing a timed-recording function at a message since automatic access is carried out, fault which will not be noticed without manual access can be prevented.

[0010]

[Problem(s) to be Solved by the Invention] However, according to conventional personal digital assistant equipment, an addressee has to recognize having returned from the communication link outside of the circle to a communication link within the circle by warning, and has to check whether there is any message by which timed recording was carried out to the timed-recording function by which applied the lug, for example to the loudspeaker after that, and automatic access was carried out. Therefore, an addressee has the problem that it cannot check whether there is any message by which may not appear in personal digital assistant equipment and timed recording was carried out in that case to the timed-recording function even if it is returning to a communication link within the circle.

[0011] Therefore, the purpose of this invention is to offer the personal digital assistant equipment which can make an addressee recognize whether there is any message by which timed recording was carried out to the timed-recording function, when the addressee has returned from the communication link outside of the circle to a communication link within the circle.

[0012]

[Means for Solving the Problem] The personal digital assistant equipment characterized by equipping this invention with the processing section reported after detecting the communication link outside of the circle and a communication link within the circle, communicating with said base station automatically in the personal digital assistant equipment which has the function which carries and communicates through a base station in order to realize the above-mentioned purpose and displaying this communication link result is offered.

[0013] Since it indicates whether there is any message by which timed recording was carried out to the timed-recording function automatically and he is trying to report it according to the above-mentioned configuration when the addressee has returned from the communication link

outside of the circle to a communication link within the circle, for example, the existence of the message by which timed recording was carried out to the addressee can be made to recognize certainly irrespective of an addressee's present situation.

[0014]

[Embodiment of the Invention] Drawing 1 is the outline block diagram showing the operation gestalt of the personal digital assistant equipment of this invention. This personal digital assistant equipment 100 has the composition that a control section 110, the transceiver section 120, a display 130, the sound I/O section 140 and a control unit 150, the other vibrator 160, and memory 170 grade had been arranged at the case, and the timed-recording processing section 200 has been arranged at the list.

[0015] It connects with each part of the above, and a control section 110 analyzes the signal sent out from the transceiver section 120, the sound I/O section 140, and control unit 150 grade, and has the function which distributes a predetermined signal to the transceiver section 120, a display 130, the sound I/O section 140, vibrator 160, and memory 170 grade by the analysis result.

[0016] The transceiver section 120 has the function which sends out the signal transmission which it has the antenna 121 grade for transmission and reception, and transmits the signal transmission sent out from a control section 110 to a base station, and is transmitted from a base station to a control section 110. It has the liquid crystal display (Liquid Crystal Display) 131 grade of for example, a STN (Super Twisted Nematic) method, and a display 130 has the function which displays a predetermined figure, a predetermined alphabetic character, etc. based on the status signal sent out from a control section 110.

[0017] The sound I/O section 140 has the function which sends out the acoustic signal which it has the loudspeaker 141 and microphone 142 grade which change by a piezoelectric device etc., and outputs predetermined voice, a predetermined beep sound, etc. from a loudspeaker 141 based on the acoustic signal sent out from a control section 110, and is inputted into a microphone 142 to a control section 110. It has for example, the number key and the communication link initiation key 151 grade, and a control unit 150 has the function which sends out the actuation signal inputted by actuation of each key 151 to a control section 110.

[0018] Vibrator 160 consists of motors which have for example, eccentric weight, based on the driving signal sent out from a control section 110, drives a motor, rotates eccentric weight, and has the function to vibrate a case. Memory 170 consists of semiconductor memory (RAM (Random AccessMemory)) etc., and has the function which writes in, reads the information which is sent out from a control section 110, and which has memorized or memorized the signal, and is sent out to a control section 110 as a signal.

[0019] The timed-recording processing section 200 is the principal part of this personal digital assistant equipment 100, and when the addressee who possesses personal digital assistant equipment 100 has returned from the communication link outside of the circle to a communication link within the circle, it has the function to indicate whether there is any message by which timed recording was carried out to the timed-recording function automatically, and to report it.

[0020] Drawing 2 is the block diagram showing the timed-recording processing section 200 which is the principal part of the personal digital assistant equipment 100 shown in drawing 1 and the control section 110 related to processing of this timed-recording processing section 200, the transceiver section 120, a display 130, the sound I/O section 140, and the example of a detail configuration of vibrator 160. The personal digital assistant equipment 100 of this configuration is a digital cellular phone of a PDC (Personal Digital Cellular) method to which two frequency bands, a 800MHz band and a 1.5GHz band, are assigned.

[0021] Sound signal processing circuit 111A by which the control section 110 was connected to the sound I/O section 140, Time-Division-Multiplexing circuit 111B connected to this sound signal processing circuit 111A, The modulator 112, mixer 113a which are connected to this Time-Division-Multiplexing circuit 111B in order toward the transmit direction, Amplifier 115b connected in order toward RF (Radio Frequency) filter 114a, amplifier 115a, and a receive direction, RF filter 114b, mixer 113b, 1st IF (Intermediate Frequency) filter 117a, Amplifier 115c,

mixer 113c, the 2IF-filter117b, 115d of amplifier, and demodulator 118 pan are equipped with the frequency synthesizer 119 connected at Mixers 113a and 113b, respectively.

[0022] Sound signal processing circuit 111A has the function to perform analog-ization of the voice outputted to the audio digitization and the audio loudspeaker which are inputted from the microphone 142 of the sound I/O section 140. Time-Division-Multiplexing circuit 111B has the function which communicates a multiple channel by one circuit by changing the voice which plurality digitized to every fixed time amount (time slot), respectively, and transmitting and receiving it.

[0023] The metal pattern which becomes an inductor (L), a capacitor (C), and equivalence is formed, for example on a thin ceramic layer, the laminating ceramic filter on which many layers it was put is used, and the RF filters 114a and 114b have the function in which the resonance frequency decided by the value of L and C and its near serve as a passband. The SAW (Surface acoustic Wave) filter with the steep damping property (rate of a roll-off) from a passband to an inhibition zone which used Xtal, for example as a piezo electric crystal is used, and the 1IF-filter117a and 2nd IF filter 117b have the function in which the resonance frequency and near when resonating the surface acoustic waves transmitted in the front face of a piezo electric crystal serve as a passband, in order to take out the signal of a message channel.

[0024] While the transceiver section 120 is connected to the antenna 121 for transmission and reception, amplifier 115a of the transmitting side of a control section 110 and amplifier 115b of a receiving side are equipped with connection, now the splitter 122 which is, respectively. A splitter 122 has the function in which the resonance frequency which cannot break easily even if large power is built and near when a dielectric filter being used, for example, confining electric field in the interior of ferroelectrics, such as barium titanate, and resonating a field inside serve as a passband.

[0025] It has the timed-recording access circuit 202 connected to the area detector 201 where the timed-recording processing section 200 was connected to Time-Division-Multiplexing circuit 111B, and this area detector 201, the message indicator control circuit 203 connected to Time-Division-Multiplexing circuit 111B, and the information circuit 205 connected to the timer 204 connected to Time-Division-Multiplexing circuit 111B, and this timer 204. In addition, the message indicator control circuit 203 is connected with the liquid crystal display 131 of a display 130, and the information circuit 205 is connected with the loudspeaker 141 of vibrator 160 and the sound I/O section 140.

[0026] The area detector 201 detects that the addressee who possesses personal digital assistant equipment 100 has returned from the communication link outside of the circle to a communication link within the circle, and has the function which sends out the detection result to the timed-recording access circuit 202, for example, is constituted by the inverter, the AND gate, the flip-flop, etc. The timed-recording access circuit 202 has the function which accesses the timed-recording function of a base station automatically by the detection result from the area detector 201.

[0027] The message indicator control circuit 203 has the function to which the existence of the message by which timed recording was carried out to the timed-recording function transmitted from the base station is displayed on the liquid crystal display 131 of a display 130.

[0028] When the timer 204 started the count-down of the setup time when the existence of the message by which timed recording of the time amount of arbitration was beforehand carried out to the timed-recording function from those with \*\* which can be set up, and a base station had been transmitted, it stops a count-down of the setup time when the addressee did manual access at the timed-recording function of a base station, and the setup time counts down to the last, it has the function in which an addressee sends out the notice of a purport which has not carried out manual access to the timed-recording function of a base station at an information circuit 205.

[0029] By the notice from a timer 204, the information circuit 205 drives vibrator 160 and has the function to generate a predetermined beep sound, voice, etc. from the loudspeaker 141 of the sound I/O section 140.

[0030] Drawing 3 is a flow chart which shows the example of operation in the case of carrying

out automatic access to the answering machine service by the personal digital assistant equipment 100 shown in drawing 2. The actuation in the case of communicating between personal digital assistant equipment 100 in a communication link within the circle is the same as explanation of the conventional technique. And the addressee who possesses personal digital assistant equipment (the 2nd personal digital assistant equipment) 100 The location where an electric wave does not reach the communication link outside of the circle from a communication link within the circle in migration 100, i.e., the 2nd personal digital assistant equipment, For example, when the transmitting person who possesses personal digital assistant equipment (the 1st personal digital assistant equipment) 100 communicates to the 2nd personal digital assistant equipment 100 after being placed into the underground center or the subway, it operates as follows (step S1).

[0031] first, the timed-recording function of a base station -- the 2nd personal digital assistant equipment 100 -- replacing -- the sending signal from the 1st personal digital assistant equipment 100 -- winning popularity -- a predetermined message (for example, -- " -- this is \*\*\* watch.) Now, it cannot appear in a telephone. please record an identifier, the telephone number, and a message after dial tone. " -- it transmits to the 1st personal digital assistant equipment 100. Next, a transmitting person does timed recording of the required message to the timed-recording function of a base station from the 1st personal digital assistant equipment 100 according to this message.

[0032] Then, by continuing looking for the control channel of a nearby base station, and performing location registration between base stations, the area detector 201 of the 2nd personal digital assistant equipment 100 detects that the addressee who possesses the 2nd personal digital assistant equipment 100 has returned from the communication link outside of the circle to a communication link within the circle, and sends out the detection result to the timed-recording access circuit 202 (step S2).

[0033] The timed-recording access circuit 202 starts automatic access to the timed-recording function of a base station by the detection result from the area detector 201 (step S3).

[0034] That is, the timed-recording access circuit 202 sends out the sending signal (henceforth an access signal) to the timed-recording function of a base station to Time-Division-Multiplexing circuit 111B. Time-Division-Multiplexing circuit 111B changes an access signal to every fixed time amount (time slot), and sends it out to a modulator 112. A modulator 112 changes an access signal into a RF signal, and sends it out to mixer 113a. Mixer 113a compounds the signal and access signal from a frequency synthesizer 119 which operate in response to the reference frequency signals TCOX, such as a quartz resonator, and sends them out to RF filter 114a.

[0035] RF filter 114a filters an access signal to 1.429GHz - 1.453GHz, and sends it out to amplifier 115a. Amplifier 115a amplifies an access signal and sends it out to a splitter 122. And a splitter 122 separates an access signal spectrally into transmit frequencies, and transmits it to the timed-recording function of a base station through the antenna 121 for transmission and reception.

[0036] The timed-recording function of a base station transmits the signal of message \*\* to the 2nd personal digital assistant equipment 100, when there is a message by which timed recording is carried out. The splitter 122 of the 2nd personal digital assistant equipment 100 separates spectrally into received frequency the input signal (henceforth a message signal) of message \*\* which received through the antenna 121 for transmission and reception, and sends it out to amplifier 115b (step S4). Amplifier 115b amplifies a message signal and sends it out to RF filter 114b. RF filter 114b filters a message signal to 1.477GHz - 1.501GHz, and sends it out to mixer 113b. Mixer 113b compounds the signal and message signal from a frequency synthesizer 119, and sends them out to 1st IF filter 117a.

[0037] 1st IF filter 117a filters a message signal to 243.95MHz or 248.45MHz, and sends it out to amplifier 115c. Amplifier 115c amplifies a message signal and sends it out to 2nd IF filter 117b through mixer 113c. 2nd IF filter 117b filters a message signal to 10.7MHz, and sends it out to 115d of amplifier. 115d of amplifiers amplifies a message signal, and they send it out to a demodulator 118. A demodulator 118 changes a message signal into a digital signal, and sends it out to Time-Division-Multiplexing circuit 111B. And Time-Division-Multiplexing circuit 111B



sends out a message signal to the message indicator control circuit 203 and a timer 204.

[0038] The message indicator control circuit 203 displays on the liquid crystal display 131 of a display 130 a purport with the message by which timed recording was carried out to the timed-recording function of a base station, for example, "those with a timed-recording message", by the message signal from Time-Division-Multiplexing circuit 111B. To coincidence, a timer 204 starts a count-down of the setup time by the message signal from Time-Division-Multiplexing circuit 111B (steps S5 and S6). And when an addressee does manual access at the timed-recording function of a base station, a count-down of the setup time is stopped (steps S7 and S8).

[0039] On the other hand, when the setup time is counted down to the last and the addressee has not done manual access at the timed-recording function of a base station, a notice signal to that effect is sent out to the information circuit 205 (step S7, S9). By the notice from a timer 204, the information circuit 205 drives vibrator 160, and vibrates the 2nd personal digital assistant equipment 100, or a predetermined beep sound, for example, an intermittent audible tone, and voice [ loudspeaker / 141 / of the sound I/O section 140 ], for example, there "there is a message by which timed recording was carried out" etc., are generated, and an addressee reports having not carried out manual access at the timed-recording function of a base station to an addressee (step S10).

[0040] Even if according to such personal digital assistant equipment 100 timed recording of the message is carried out while an addressee comes out of between the communication link outside of the circle and communication link within the circle or enters without consciousness Even if it carries out automatic access and an addressee is returning to a timed-recording function further a communication link within the circle, when not appearing in personal digital assistant equipment Fault which will not notice it without manual access after it is left for a long period of time whether there is any message by which timed recording was carried out to the timed-recording function, without noticing a message since it can recognize certainly can be prevented.

[0041] In addition, with the operation gestalt mentioned above, although the communication link between personal digital assistant equipment was explained, effectiveness with the same said of the communication link with personal digital assistant equipment and a general telephone can be acquired. Furthermore, although the cellular phone was explained to the example as personal digital assistant equipment, if it is personal digital assistant equipment using wireless, such as PHS, it is applicable similarly. Moreover, as an example in which personal digital assistant equipment is put on the location which an electric wave does not reach, when personal digital assistant equipment is a cellular phone, when personal digital assistant equipment is PHS, the time of being put on the communication link outside of the circle in a high-speed migration car etc. is assumed in an underground center or a subway, but the same effectiveness is done so also when personal digital assistant equipment is turned off, for example.

[0042] Furthermore, when there was a message by which timed recording is carried out to the timed-recording function of a base station, it was made to report message \*\*, but also when there is no message, it may be made to report nothing [ message ]. Moreover, also to services other than answering machine service, it is applicable so that the same effectiveness may be done so.

[0043]

[Effect of the Invention] Since an addressee can be made to recognize certainly whether there is any message by which timed recording was carried out to the timed-recording function according to this invention as stated above when the addressee has returned from the communication link outside of the circle to a communication link within the circle, what it will be left and eliminated, without carrying out the check of a message for a long period of time, for example can be prevented.

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TECHNICAL FIELD

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[Field of the Invention] This invention relates to personal digital assistant equipment for a user to carry and communicate.

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PRIOR ART

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[Description of the Prior Art] In recent years, personal digital assistant equipments, such as a cellular phone (pocket mold telephone) and PHS (simple pocket mold telephone), have been used abundantly. Generally such personal digital assistant equipment is a case with the configuration that a control section, the transceiver section, a display, the sound I/O section, a control unit, etc. have been arranged.

[0003] When communicating between [ of such a configuration ] personal digital assistant equipment, first, a transmitting person pushes the call number of an addressee's personal digital assistant equipment (henceforth the 2nd personal digital assistant equipment) for example, by the number key of the control unit of the personal digital assistant equipment (henceforth the 1st personal digital assistant equipment), and presses a communication link initiation key.

[0004] Then, while the call number is displayed on a display, signal transmission is transmitted to a nearby base station and the nearby mobile communication exchange (only henceforth a base station) through the transceiver section from a control section. And the signal transmission received in the nearby base station is transmitted to the transceiver section of the 2nd personal digital assistant equipment. The signal transmission received in the transceiver section of the 2nd personal digital assistant equipment is sent out to a control section, and a ring tone is emitted from the loudspeaker of the sound I/O section.

[0005] If the ring tone from a microphone is heard, an addressee will press the communication link initiation key of the control unit of the 2nd personal digital assistant equipment, and will answer toward the microphone of the sound I/O section. Then, the signal transmission by this response is transmitted to a nearby base station through the transceiver section from a control section. And the signal transmission received in the nearby base station is transmitted to the transceiver section of the 1st personal digital assistant equipment. The signal transmission received in the transceiver section of the 1st personal digital assistant equipment is sent out to a control section, and voice is uttered from the loudspeaker of the sound I/O section. A communication link becomes possible between the 1st and 2nd personal digital assistant equipment henceforth [ this ].

[0006] By the way, various service functions, such as for example, answering machine service, call-waiting service, and a call forwarding service, can be set now to personal digital assistant equipment. the time of answering machine service being put on the communication link outside of the circle in a high-speed migration car etc., when the location which an electric wave does not reach [ the 2nd personal digital assistant equipment ], for example, personal digital assistant equipment, is a cellular phone and the inside of an underground center or a subway and personal digital assistant equipment are PHS -- the timed-recording function of a base station -- the 2nd personal digital assistant equipment -- replacing -- the sending signal from the 1st personal digital assistant equipment -- winning popularity -- a predetermined message (for example, -- " -- this is \*\*\* watch.) Now, it cannot appear in a telephone. please record an identifier, the telephone number, and a message after dial tone. " -- it is the service transmitted to the 1st personal digital assistant equipment.

[0007] Even if such answering machine service is set as the 2nd personal digital assistant equipment, however, conventionally When a communication link is from a transmitting person

while the addressee had come out from a communication link within the circle to the communication link outside of the circle, for example, an addressee Even if it returned to a communication link within the circle after that, he may not notice what answering machine service was used for by the transmitting person, and the existence of a message needed to be asked to the timed-recording function of a base station by manual access from the 1st personal digital assistant equipment each time.

[0008] Then, the receiver which outputs communication link outside-of-the-circle information to personal digital assistant equipment from an input signal, A means to detect having been in the communication link outside of the circle the timer which sets a communication link outside-of-the-circle period as arbitration, and beyond the period set up by the timer based on the communication link outside-of-the-circle information on a receiver, and having returned to a communication link within the circle after that, In order to access the timed-recording function of a means to generate warning based on this detection result, and a base station, when it has a means to drive a transmitter, an addressee once comes out from a communication link within the circle to the communication link outside of the circle and it has returned to a communication link within the circle after that The personal digital assistant equipment which can carry out automatic access is proposed by warning generating and the timed-recording function (refer to JP,9-46760,A).

[0009] According to such personal digital assistant equipment, even if timed recording of the message is carried out while an addressee comes out of between the communication link outside of the circle and communication link within the circle or enters without consciousness, after being left for a long period of time, without noticing a timed-recording function at a message since automatic access is carried out, fault which will not be noticed without manual access can be prevented.

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EFFECT OF THE INVENTION

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[Effect of the Invention] Since an addressee can be made to recognize certainly whether there is any message by which timed recording was carried out to the timed-recording function according to this invention as stated above when the addressee has returned from the communication link outside of the circle to a communication link within the circle, what it will be left and eliminated, without carrying out the check of a message for a long period of time, for example can be prevented.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] However, according to conventional personal digital assistant equipment, an addressee has to recognize having returned from the communication link outside of the circle to a communication link within the circle by warning, and has to check whether there is any message by which timed recording was carried out to the timed-recording function by which applied the lug, for example to the loudspeaker after that, and automatic access was carried out. Therefore, an addressee has the problem that it cannot check whether there is any message by which may not appear in personal digital assistant equipment and timed recording was carried out in that case to the timed-recording function even if it is returning to a communication link within the circle.

[0011] Therefore, the purpose of this invention is to offer the personal digital assistant equipment which can make an addressee recognize whether there is any message by which timed recording was carried out to the timed-recording function, when the addressee has returned from the communication link outside of the circle to a communication link within the circle.

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MEANS

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[Means for Solving the Problem] The personal digital assistant equipment characterized by equipping this invention with the processing section reported after detecting the communication link outside of the circle and a communication link within the circle, communicating with said base station automatically in the personal digital assistant equipment which has the function which carries and communicates through a base station in order to realize the above-mentioned purpose and displaying this communication link result is offered.

[0013] Since it indicates whether there is any message by which timed recording was carried out to the timed-recording function automatically and he is trying to report it according to the above-mentioned configuration when the addressee has returned from the communication link outside of the circle to a communication link within the circle, for example, the existence of the message by which timed recording was carried out to the addressee can be made to recognize certainly irrespective of an addressee's present situation situation.

[0014]

[Embodiment of the Invention] Drawing 1 is the outline block diagram showing the operation gestalt of the personal digital assistant equipment of this invention. This personal digital assistant equipment 100 has the composition that a control section 110, the transceiver section 120, a display 130, the sound I/O section 140 and a control unit 150, the other vibrator 160, and memory 170 grade had been arranged at the case, and the timed-recording processing section 200 has been arranged at the list.

[0015] It connects with each part of the above, and a control section 110 analyzes the signal sent out from the transceiver section 120, the sound I/O section 140, and control unit 150 grade, and has the function which distributes a predetermined signal to the transceiver section 120, a display 130, the sound I/O section 140, vibrator 160, and memory 170 grade by the analysis result.

[0016] The transceiver section 120 has the function which sends out the signal transmission which it has the antenna 121 grade for transmission and reception, and transmits the signal transmission sent out from a control section 110 to a base station, and is transmitted from a base station to a control section 110. It has the liquid crystal display (Liquid Crystal Display) 131 grade of for example, a STN (Super Twisted Nematic) method, and a display 130 has the function which displays a predetermined figure, a predetermined alphabetic character, etc. based on the status signal sent out from a control section 110.

[0017] The sound I/O section 140 has the function which sends out the acoustic signal which it has the loudspeaker 141 and microphone 142 grade which change by a piezoelectric device etc., and outputs predetermined voice, a predetermined beep sound, etc. from a loudspeaker 141 based on the acoustic signal sent out from a control section 110, and is inputted into a microphone 142 to a control section 110. It has for example, the number key and the communication link initiation key 151 grade, and a control unit 150 has the function which sends out the actuation signal inputted by actuation of each key 151 to a control section 110.

[0018] Vibrator 160 consists of motors which have for example, eccentric weight, based on the driving signal sent out from a control section 110, drives a motor, rotates eccentric weight, and has the function to vibrate a case. Memory 170 consists of semiconductor memory (RAM

(Random AccessMemory)) etc., and has the function which writes in, reads the information which is sent out from a control section 110, and which has memorized or memorized the signal, and is sent out to a control section 110 as a signal.

[0019] The timed-recording processing section 200 is the principal part of this personal digital assistant equipment 100, and when the addressee who possesses personal digital assistant equipment 100 has returned from the communication link outside of the circle to a communication link within the circle, it has the function to indicate whether there is any message by which timed recording was carried out to the timed-recording function automatically, and to report it.

[0020] Drawing 2 is the block diagram showing the timed-recording processing section 200 which is the principal part of the personal digital assistant equipment 100 shown in drawing 1 and the control section 110 related to processing of this timed-recording processing section 200, the transceiver section 120, a display 130, the sound I/O section 140, and the example of a detail configuration of vibrator 160. The personal digital assistant equipment 100 of this configuration is a digital cellular phone of a PDC (Personal DigitalCellular) method to which two frequency bands, a 800MHz band and a 1.5GHz band, are assigned.

[0021] Sound signal processing circuit 111A by which the control section 110 was connected to the sound I/O section 140, Time-Division-Multiplexing circuit 111B connected to this sound signal processing circuit 111A, The modulator 112, mixer 113a which are connected to this Time-Division-Multiplexing circuit 111B in order toward the transmit direction, Amplifier 115b connected in order toward RF (Radio Frequency) filter 114a, amplifier 115a, and a receive direction, RF filter 114b, mixer 113b, 1st IF (IntermediateFrequency) filter 117a, Amplifier 115c, mixer 113c, the 2IF-filter117b, 115d of amplifier, and demodulator 118 pan are equipped with the frequency synthesizer 119 connected at Mixers 113a and 113b, respectively.

[0022] Sound signal processing circuit 111A has the function to perform analog-ization of the voice outputted to the audio digitization and the audio loudspeaker which are inputted from the microphone 142 of the sound I/O section 140. Time-Division-Multiplexing circuit 111B has the function which communicates a multiple channel by one circuit by changing the voice which plurality digitized to every fixed time amount (time slot), respectively, and transmitting and receiving it.

[0023] The metal pattern which becomes an inductor (L), a capacitor (C), and equivalence is formed, for example on a thin ceramic layer, the laminating ceramic filter on which many layers it was put is used, and the RF filters 114a and 114b have the function in which the resonance frequency decided by the value of L and C and its near serve as a passband. The SAW (Surface acoustic Wave) filter with the steep damping property (rate of a roll-off) from a passband to an inhibition zone which used Xtal, for example as a piezo electric crystal is used, and the 1IF-filter117a and 2nd IF filter 117b have the function in which the resonance frequency and near when resonating the surface acoustic waves transmitted in the front face of a piezo electric crystal serve as a passband, in order to take out the signal of a message channel.

[0024] While the transceiver section 120 is connected to the antenna 121 for transmission and reception, amplifier 115a of the transmitting side of a control section 110 and amplifier 115b of a receiving side are equipped with connection, now the splitter 122 which is, respectively. A splitter 122 has the function in which the resonance frequency which cannot break easily even if large power is built and near when a dielectric filter being used, for example, confining electric field in the interior of ferroelectrics, such as barium titanate, and resonating a field inside serve as a passband.

[0025] It has the timed-recording access circuit 202 connected to the area detector 201 where the timed-recording processing section 200 was connected to Time-Division-Multiplexing circuit 111B, and this area detector 201, the message indicator control circuit 203 connected to Time-Division-Multiplexing circuit 111B, and the information circuit 205 connected to the timer 204 connected to Time-Division-Multiplexing circuit 111B, and this timer 204. In addition, the message indicator control circuit 203 is connected with the liquid crystal display 131 of a display 130, and the information circuit 205 is connected with the loudspeaker 141 of vibrator 160 and the sound I/O section 140.



[0026] The area detector 201 detects that the addressee who possesses personal digital assistant equipment 100 has returned from the communication link outside of the circle to a communication link within the circle, and has the function which sends out the detection result to the timed-recording access circuit 202, for example, is constituted by the inverter, the AND gate, the flip-flop, etc. The timed-recording access circuit 202 has the function which accesses the timed-recording function of a base station automatically by the detection result from the area detector 201.

[0027] The message indicator control circuit 203 has the function to which the existence of the message by which timed recording was carried out to the timed-recording function transmitted from the base station is displayed on the liquid crystal display 131 of a display 130.

[0028] When the timer 204 started the count-down of the setup time when the existence of the message by which timed recording of the time amount of arbitration was beforehand carried out to the timed-recording function from those with \*\* which can be set up, and a base station had been transmitted, it stops a count-down of the setup time when the addressee did manual access at the timed-recording function of a base station, and the setup time counts down to the last, it has the function in which an addressee sends out the notice of a purport which has not carried out manual access to the timed-recording function of a base station at an information circuit 205.

[0029] By the notice from a timer 204, the information circuit 205 drives vibrator 160 and has the function to generate a predetermined beep sound, voice, etc. from the loudspeaker 141 of the sound I/O section 140.

[0030] Drawing 3 is a flow chart which shows the example of operation in the case of carrying out automatic access to the answering machine service by the personal digital assistant equipment 100 shown in drawing 2. The actuation in the case of communicating between personal digital assistant equipment 100 in a communication link within the circle is the same as explanation of the conventional technique. And the addressee who possesses personal digital assistant equipment (the 2nd personal digital assistant equipment) 100 The location where an electric wave does not reach the communication link outside of the circle from a communication link within the circle in migration 100, i.e., the 2nd personal digital assistant equipment, For example, when the transmitting person who possesses personal digital assistant equipment (the 1st personal digital assistant equipment) 100 communicates to the 2nd personal digital assistant equipment 100 after being placed into the underground center or the subway, it operates as follows (step S1).

[0031] first, the timed-recording function of a base station -- the 2nd personal digital assistant equipment 100 -- replacing -- the sending signal from the 1st personal digital assistant equipment 100 -- winning popularity -- a predetermined message (for example, -- "this is \*\*\* watch.) Now, it cannot appear in a telephone. please record an identifier, the telephone number, and a message after dial tone. " -- it transmits to the 1st personal digital assistant equipment 100. Next, a transmitting person does timed recording of the required message to the timed-recording function of a base station from the 1st personal digital assistant equipment 100 according to this message.

[0032] Then, by continuing looking for the control channel of a nearby base station, and performing location registration between base stations, the area detector 201 of the 2nd personal digital assistant equipment 100 detects that the addressee who possesses the 2nd personal digital assistant equipment 100 has returned from the communication link outside of the circle to a communication link within the circle, and sends out the detection result to the timed-recording access circuit 202 (step S2).

[0033] The timed-recording access circuit 202 starts automatic access to the timed-recording function of a base station by the detection result from the area detector 201 (step S3).

[0034] That is, the timed-recording access circuit 202 sends out the sending signal (henceforth an access signal) to the timed-recording function of a base station to Time-Division-Multiplexing circuit 111B. Time-Division-Multiplexing circuit 111B changes an access signal to every fixed time amount (time slot), and sends it out to a modulator 112. A modulator 112 changes an access signal into a RF signal, and sends it out to mixer 113a. Mixer 113a compounds the signal

and access signal from a frequency synthesizer 119 which operate in response to the reference frequency signals TCOX, such as a quartz resonator, and sends them out to RF filter 114a.

[0035] RF filter 114a filters an access signal to 1.429GHz – 1.453GHz, and sends it out to amplifier 115a. Amplifier 115a amplifies an access signal and sends it out to a splitter 122. And a splitter 122 separates an access signal spectrally into transmit frequencies, and transmits it to the timed-recording function of a base station through the antenna 121 for transmission and reception.

[0036] The timed-recording function of a base station transmits the signal of message \*\* to the 2nd personal digital assistant equipment 100, when there is a message by which timed recording is carried out. The splitter 122 of the 2nd personal digital assistant equipment 100 separates spectrally into received frequency the input signal (henceforth a message signal) of message \*\* which received through the antenna 121 for transmission and reception, and sends it out to amplifier 115b (step S4). Amplifier 115b amplifies a message signal and sends it out to RF filter 114b. RF filter 114b filters a message signal to 1.477GHz – 1.501GHz, and sends it out to mixer 113b. Mixer 113b compounds the signal and message signal from a frequency synthesizer 119, and sends them out to 1st IF filter 117a.

[0037] 1st IF filter 117a filters a message signal to 243.95MHz or 248.45MHz, and sends it out to amplifier 115c. Amplifier 115c amplifies a message signal and sends it out to 2nd IF filter 117b through mixer 113c. 2nd IF filter 117b filters a message signal to 10.7MHz, and sends it out to 115d of amplifier. 115d of amplifiers amplifies a message signal, and they send it out to a demodulator 118. A demodulator 118 changes a message signal into a digital signal, and sends it out to Time-Division-Multiplexing circuit 111B. And Time-Division-Multiplexing circuit 111B sends out a message signal to the message indicator control circuit 203 and a timer 204.

[0038] The message indicator control circuit 203 displays on the liquid crystal display 131 of a display 130 a purport with the message by which timed recording was carried out to the timed-recording function of a base station, for example, "those with a timed-recording message", by the message signal from Time-Division-Multiplexing circuit 111B. To coincidence, a timer 204 starts a count-down of the setup time by the message signal from Time-Division-Multiplexing circuit 111B (steps S5 and S6). And when an addressee does manual access at the timed-recording function of a base station, a count-down of the setup time is stopped (steps S7 and S8).

[0039] On the other hand, when the setup time is counted down to the last and the addressee has not done manual access at the timed-recording function of a base station, a notice signal to that effect is sent out to the information circuit 205 (step S7, S9). By the notice from a timer 204, the information circuit 205 drives vibrator 160, and vibrates the 2nd personal digital assistant equipment 100, or a predetermined beep sound, for example, an intermittent audible tone, and voice [ loudspeaker / 141 / of the sound I/O section 140 ], for example, there "there is a message by which timed recording was carried out" etc., are generated, and an addressee reports having not carried out manual access at the timed-recording function of a base station to an addressee (step S10).

[0040] Even if according to such personal digital assistant equipment 100 timed recording of the message is carried out while an addressee comes out of between the communication link outside of the circle and communication link within the circle or enters without consciousness Even if it carries out automatic access and an addressee is returning to a timed-recording function further a communication link within the circle, when not appearing in personal digital assistant equipment Fault which will not notice it without manual access after it is left for a long period of time whether there is any message by which timed recording was carried out to the timed-recording function, without noticing a message since it can recognize certainly can be prevented.

[0041] In addition, with the operation gestalt mentioned above, although the communication link between personal digital assistant equipment was explained, effectiveness with the same said of the communication link with personal digital assistant equipment and a general telephone can be acquired. Furthermore, although the cellular phone was explained to the example as personal digital assistant equipment, if it is personal digital assistant equipment using wireless, such as PHS, it is applicable similarly. Moreover, as an example in which personal digital assistant

equipment is put on the location which an electric wave does not reach, when personal digital assistant equipment is a cellular phone, when personal digital assistant equipment is PHS, the time of being put on the communication link outside of the circle in a high-speed migration car etc. is assumed in an underground center or a subway, but the same effectiveness is done so also when personal digital assistant equipment is turned off, for example.

[0042] Furthermore, when there was a message by which timed recording is carried out to the timed-recording function of a base station, it was made to report message \*\*, but also when there is no message, it may be made to report nothing [ message ]. Moreover, also to services other than answering machine service, it is applicable so that the same effectiveness may be done so.

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[Translation done.]

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1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.\*\*\* shows the word which can not be translated.

3.In the drawings, any words are not translated.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the outline block diagram showing the operation gestalt of the personal digital assistant equipment of this invention.

[Drawing 2] It is the block diagram showing the example of a detail configuration of each part related to processing of the timed-recording processing section which is the principal part of the personal digital assistant equipment shown in drawing 1 , and this timed-recording processing section.

[Drawing 3] It is the flow chart which shows the example of the personal digital assistant equipment shown in drawing 1 of operation.

[Description of Notations]

100 Personal Digital Assistant Equipment

110 Control Section

120 Transceiver Section

130 Display

140 Sound I/O Section

150 Control Unit

160 Vibrator

170 Memory

200 Timed-Recording Processing Section

111A Sound signal processing circuit

111B Time-Division-Multiplexing circuit

121 Antenna for Transmission and Reception

122 Splitter

141 Loudspeaker

142 Microphone

201 Area Detector

202 Timed-Recording Access Circuit

203 Message Indicator Control Circuit

204 Timer

205 Information Circuit

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[Translation done.]

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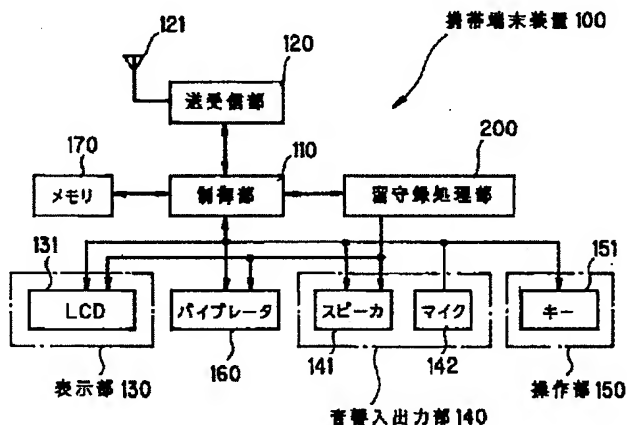
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(54) 【発明の名称】 携帯端末装置

(57) 【要約】

【課題】 受信者が通信圏外から通信圏内に戻ってきたときに、受信者に留守録機能に留守録されたメッセージが有るか否かを認識させることができる携帯端末装置を提供すること。

【解決手段】 携帯して基地局を介して通信する機能を有する携帯端末装置100に、通信圏外・通信圏内を検出して前記基地局と自動で通信し、この通信結果を表示した後に報知する処理部200を備える。



**【特許請求の範囲】**

**【請求項 1】** 携帯して基地局を介して通信する機能を有する携帯端末装置において、通信圏外・通信圏内を検出して前記基地局と自動で通信し、この通信結果を表示した後に報知する処理部を備えたことを特徴とする携帯端末装置。

**【請求項 2】** 携帯して基地局を介して通信する機能を有する携帯端末装置において、通信圏外から通信圏内へ移動した際に、前記基地局の留守録機能と自動で通信し、前記留守録機能に伝言が有るときは、その旨を表示した後に報知する処理部を備えたことを特徴とする携帯端末装置。

**【請求項 3】** 前記伝言が有る旨の報知は、前記伝言が有る旨を表示した後の所定時間内に、前記基地局の留守録機能と手動で通信されなかったときに行われるように構成されている請求項 2 に記載の携帯端末装置。

**【請求項 4】** 携帯して基地局を介して通信する機能を有する携帯端末装置において、通信圏外・通信圏内を検出する検出部と、前記検出部の検出結果により、前記基地局と自動で通信する通信部と、前記通信部の通信結果を表示する表示部と、前記通信部の通信結果により、所定時間の計測を開始する計測部と、前記所定時間経過後に、前記通信部の通信結果を報知する報知部とを備えたことを特徴とする携帯端末装置。

**【請求項 5】** 携帯して基地局を介して通信する機能を有する携帯端末装置において、通信圏外・通信圏内を検出する検出部と、前記検出部の検出結果により、通信圏外から通信圏内へ移動したときは、前記基地局の留守録機能と自動で通信する通信部と、前記通信部の通信結果により、前記留守録機能に伝言が有るときは、その旨を表示する表示部と、前記通信部の通信結果により、前記留守録機能に伝言が有るときは、所定時間の計測を開始する計測部と、前記所定時間内に、前記基地局の留守録機能と手動で通信されなかったときは、前記伝言が有る旨を報知する報知部とを備えたことを特徴とする携帯端末装置。

**【発明の詳細な説明】****【0001】**

**【発明の属する技術分野】** 本発明は、使用者が携帯して通信するための携帯端末装置に関するものである。

**【0002】**

**【従来の技術】** 近年、携帯電話（携帯型電話機）や PHS（簡易携帯型電話機）等の携帯端末装置が多用されてきている。このような携帯端末装置は、一般的には筐体に制御部、送受信部、表示部、音響入出力部及び操作部等が配置された構成となっている。

**【0003】** このような構成の携帯端末装置相互で通信

する場合、先ず送信者がその携帯端末装置（以下、第 1 携帯端末装置という）の操作部の例えば番号キーにより受信者の携帯端末装置（以下、第 2 携帯端末装置という）の呼出し番号を押して通信開始キーを押す。

**【0004】** すると、その呼出し番号が表示部に表示されると共に、通信信号が制御部から送受信部を介して最寄りの基地局及び移動通信交換局（以下、単に基地局という）へ送信される。そして、最寄りの基地局で受信された通信信号は、第 2 携帯端末装置の送受信部へ送信される。第 2 携帯端末装置の送受信部で受信された通信信号は制御部へ送出され、音響入出力部の例えばスピーカから呼出し音が発せられる。

**【0005】** 受信者はマイクからの呼出し音を聞いた後、第 2 携帯端末装置の操作部の通信開始キーを押して音響入出力部の例えばマイクに向かって応答する。すると、この応答による通信信号が制御部から送受信部を介して最寄りの基地局へ送信される。そして、最寄りの基地局で受信された通信信号は、第 1 携帯端末装置の送受信部へ送信される。第 1 携帯端末装置の送受信部で受信された通信信号は制御部へ送出され、音響入出力部の例えばスピーカから音声が発せられる。これ以降、第 1 及び第 2 携帯端末装置間で通信が可能となる。

**【0006】** ところで、携帯端末装置には、例えば留守番電話サービス、キャッチホンサービス、転送電話サービス等の種々のサービス機能が設定できるようになっている。留守番電話サービスは、第 2 携帯端末装置が電波の届かない場所、例えば携帯端末装置が携帯電話のときは地下街や地下鉄内、携帯端末装置が PHS のときは高速移動車両内等の通信圏外に置かれているときに、基地局の留守録機能が第 2 携帯端末装置に代わって第 1 携帯端末装置からの送信信号を受け、所定のメッセージ（例えば、「こちらは\*\*\*番です。ただいま、電話に出ることができません。発信音の後にお名前、電話番号とメッセージを録音してください。」）を第 1 携帯端末装置に送信するサービスである。

**【0007】** ところが、このような留守番電話サービスが、第 2 携帯端末装置に設定されていても、従来は、例えば受信者が通信圏内から通信圏外に出ている間に送信者から通信があった場合、受信者は、その後に通信圏内に戻ってきても、留守番電話サービスが送信者により利用されたことに気付かないことがあり、その都度、第 1 携帯端末装置から基地局の留守録機能にメッセージの有無を手動アクセスにより問い合わせる必要があった。

**【0008】** そこで、携帯端末装置に、受信信号から通信圏外情報を出力する受信機と、通信圏外期間を任意に設定するタイマと、受信機の通信圏外情報を基にタイマにより設定された期間以上通信圏外に居て、その後に通信圏内に戻ったことを検出する手段と、この検出結果を基に警告を発生する手段及び基地局の留守録機能にアクセスするために送信機を駆動する手段とを備え、受信者

が通信圏内から通信圏外に一旦出て、その後に通信圏内に戻ってきたときに、警告発生及び留守録機能に自動アクセスすることができる携帯端末装置が提案されている（特開平 9-46760 号公報参照）。

【0009】このような携帯端末装置によれば、受信者が、自覚なしに通信圏外と通信圏内との間を出たり入ったりしている間にメッセージが留守録されていても、留守録機能に自動アクセスしてくれるので、メッセージに気が付かずに長期間放置された後に手動アクセスにより初めて気が付くような不具合を防止することができる。

【0010】

【発明が解決しようとする課題】しかし、従来の携帯端末装置によると、受信者は、通信圏外から通信圏内に戻ってきたことを警告により認識し、その後に例えばスピーカに耳を当てて自動アクセスされた留守録機能に留守録されたメッセージが有るか否かを確認しなければならない。従って、受信者は、通信圏内に戻ってきていても携帯端末装置に出られない場合があり、その場合は留守録機能に留守録されたメッセージが有るか否かを確認することができないという問題がある。

【0011】従って、本発明の目的は、受信者が通信圏外から通信圏内に戻ってきたときに、受信者に留守録機能に留守録されたメッセージが有るか否かを認識させることができる携帯端末装置を提供することにある。

【0012】

【課題を解決するための手段】本発明は、上記目的を実現するため、携帯して基地局を介して通信する機能を有する携帯端末装置において、通信圏外・通信圏内を検出して前記基地局と自動で通信し、この通信結果を表示した後に報知する処理部を備えたことを特徴とする携帯端末装置を提供する。

【0013】上記構成によれば、例えば受信者が通信圏外から通信圏内に戻ってきたときに、留守録機能に留守録されたメッセージが有るか否かを自動的に表示し報知するようにしているので、受信者の現在の状況いかに係わらず、受信者に留守録されたメッセージの有無を確実に認識させることができる。

【0014】

【発明の実施の形態】図 1 は、本発明の携帯端末装置の実施形態を示す概略ブロック図である。この携帯端末装置 100 は、筐体に制御部 110、送受信部 120、表示部 130、音響入出力部 140 及び操作部 150、その他バイプレータ 160、メモリ 170 等、並びに留守録処理部 200 が配置された構成となっている。

【0015】制御部 110 は、上記各部と接続されており、送受信部 120、音響入出力部 140、操作部 150 等から送出されてくる信号を解析し、その解析結果により所定の信号を送受信部 120、表示部 130、音響入出力部 140、バイプレータ 160、メモリ 170 等に配信する機能を有する。

【0016】送受信部 120 は、送受信用アンテナ 121 等が備えられており、制御部 110 から送出されてくる通信信号を基地局へ送信し、また基地局から送信されてくる通信信号を制御部 110 へ送出する機能を有する。表示部 130 は、例えば STN (Super Twisted Nematic) 方式の液晶ディスプレイ (Liquid Crystal Display) 131 等が備えられており、制御部 110 から送出されてくる表示信号に基づいて、所定の数字や文字等を表示する機能を有する。

【0017】音響入出力部 140 は、例えば圧電素子等で成るスピーカ 141 やマイク 142 等が備えられており、制御部 110 から送出されてくる音響信号に基づいて、スピーカ 141 から所定の音声や警告音等を出力し、またマイク 142 に入力される音響信号を制御部 110 に送出する機能を有する。操作部 150 は、例えば番号キーや通信開始キー 151 等が備えられており、各キー 151 の操作により入力される操作信号を制御部 110 に送出する機能を有する。

【0018】バイプレータ 160 は、例えば偏心ウエイトを有するモータで構成されており、制御部 110 から送出されてくる駆動信号に基づいて、モータを駆動して偏心ウエイトを回転させ、筐体を振動させる機能を有する。メモリ 170 は、例えば半導体メモリ (RAM (Random Access Memory)) 等で構成されており、制御部 110 から送出されてくる書き込み信号を記憶し、あるいは記憶している情報を読み出し信号として制御部 110 に送出する機能を有する。

【0019】留守録処理部 200 は、この携帯端末装置 100 の主要部であり、携帯端末装置 100 を所持している受信者が通信圏外から通信圏内に戻ってきたときに、留守録機能に留守録されたメッセージが有るか否かを自動的に表示し報知する機能を有する。

【0020】図 2 は、図 1 に示す携帯端末装置 100 の主要部である留守録処理部 200 及びこの留守録処理部 200 の処理に関係する制御部 110、送受信部 120、表示部 130、音響入出力部 140 及びバイプレータ 160 の詳細構成例を示すブロック図である。この構成の携帯端末装置 100 は、800MHz 帯と 1.5GHz 帯の 2 つの周波数帯域が割り当てられている PDC (Personal Digital Cellular) 方式のデジタル携帯電話である。

【0021】制御部 110 は、音響入出力部 140 に接続された音声信号処理回路 111A、この音声信号処理回路 111A に接続された時分割多重回路 111B、この時分割多重回路 111B に送信方向に向かって順に接続されている変調器 112、ミキサ 113a、RF (Radio Frequency) フィルタ 114a、増幅器 115a 及び受信方向に向かって順に接続されている増幅器 115b、RF フィルタ 114b、ミキサ 11



3b、第1IF (Intermediate Frequency) フィルタ117a、増幅器115c、ミキサ113c、第2IF フィルタ117b、増幅器115d、復調器118さらにミキサ113a、113bにそれぞれ接続されている周波数シンセサイザ119が備えられている。

【0022】音声信号処理回路111Aは、音響入出力部140のマイク142から入力される音声のデジタル化及びスピーカへ出力する音声のアナログ化を行う機能を有する。時分割多重回路111Bは、複数のデジタル化した音声それぞれ一定時間（タイムスロット）毎に切り替えて送受信することにより、1本の回線で複数チャネルの通信を行う機能を有する。

【0023】RFフィルタ114a、114bは、例えば薄いセラミック層の上にインダクタ（L）やキャパシタ（C）と等価になる金属パターンを形成し、それを何層も重ねた積層セラミックフィルタが用いられ、LとCの値で決まる共振周波数とその近傍が通過帯域となる機能を有する。第1IFフィルタ117a、第2IFフィルタ117bは、通話チャネルの信号を取り出すために、通過帯域から阻止域への減衰特性（ロールオフ率）が急峻な例えば圧電体として水晶を使用したSAW（Surface acoustic Wave）フィルタが用いられ、圧電体の表面を伝わる表面弾性波を共振させたときの共振周波数とその近傍が通過帯域となる機能を有する。

【0024】送受信部120は、送受信用アンテナ121に接続されていると共に、制御部110の送信側の増幅器115a及び受信側の増幅器115bにそれぞれ接続されている分波器122が備えられている。分波器122は、大きい電力がかかっても壊れにくい例えば誘電体フィルタが用いられ、チタン酸バリウム等の強誘電体の内部に電界を閉じ込め、内部で磁界を共振させたときの共振周波数とその近傍が通過帯域となる機能を有する。

【0025】留守録処理部200は、時分割多重回路111Bに接続されたエリア検出回路201及びこのエリア検出回路201に接続された留守録アクセス回路202と、時分割多重回路111Bに接続されたメッセージ表示制御回路203と、時分割多重回路111Bに接続されたタイマ204及びこのタイマ204に接続された報知回路205とが備えられている。尚、メッセージ表示制御回路203は、表示部130の液晶ディスプレイ131と接続されており、報知回路205は、パイプレータ160及び音響入出力部140のスピーカ141と接続されている。

【0026】エリア検出回路201は、携帯端末装置100を所持している受信者が通信圏外から通信圏内に戻ってきたことを検出し、その検出結果を留守録アクセス回路202に送出する機能を有し、例えばインバータ、アンドゲート、フリップフロップ等により構成されてい

る。留守録アクセス回路202は、エリア検出回路201からの検出結果により、基地局の留守録機能に自動的にアクセスする機能を有する。

【0027】メッセージ表示制御回路203は、基地局から送信された留守録機能に留守録されたメッセージの有無を表示部130の液晶ディスプレイ131に表示させる機能を有する。

【0028】タイマ204は、予め任意の時間が設定可能であり、基地局から留守録機能に留守録されたメッセージの有無が送信されてきた時点で設定時間のカウンタダウンを開始し、受信者が基地局の留守録機能に手動アクセスした時点で設定時間のカウンタダウンを停止し、また設定時間を最後までカウンタダウンした時点で受信者が基地局の留守録機能に手動アクセスしていない旨の通知を報知回路205に送出する機能を有する。

【0029】報知回路205は、タイマ204からの通知により、パイプレータ160を駆動し、音響入出力部140のスピーカ141から所定の警告音や音声等を発生させる機能を有する。

【0030】図3は、図2に示す携帯端末装置100による留守番電話サービスに自動アクセスする場合の動作例を示すフローチャートである。通信圏内において例えば携帯端末装置100相互で通信する場合の動作は従来技術の説明と同様である。そして、携帯端末装置（第2携帯端末装置）100を所持している受信者が、通信圏内から通信圏外に移動、即ち第2携帯端末装置100が電波の届かない場所、例えば地下街や地下鉄内に置かれた後に、携帯端末装置（第1携帯端末装置）100を所持している送信者が第2携帯端末装置100に対して通信を行った場合は、以下のように動作する（ステップS1）。

【0031】まず、基地局の留守録機能が第2携帯端末装置100に代わって第1携帯端末装置100からの送信信号を受け、所定のメッセージ（例えば、「こちらは\*\*\*番です。ただいま、電話に出ることができません。発信音の後に名前、電話番号とメッセージを録音してください。」）を第1携帯端末装置100に送信する。次に、送信者は、このメッセージに従って、第1携帯端末装置100から必要なメッセージを基地局の留守録機能に留守録する。

【0032】その後、第2携帯端末装置100のエリア検出回路201は、最寄りの基地局の制御チャンネルを探し続け、基地局との間で位置登録を行うことにより、第2携帯端末装置100を所持している受信者が通信圏外から通信圏内に戻ってきたことを検出し、その検出結果を留守録アクセス回路202に送出する（ステップS2）。

【0033】留守録アクセス回路202は、エリア検出回路201からの検出結果により、基地局の留守録機能に自動アクセスを開始する（ステップS3）。



【0034】即ち、留守録アクセス回路202は、基地局の留守録機能に対する送信信号（以下、アクセス信号という）を時分割多重回路111Bに送出する。時分割多重回路111Bは、アクセス信号を一定時間（タイムスロット）毎に切り替えて変調器112へ送出する。変調器112は、アクセス信号をRF信号に変換してミキサ113aへ送出する。ミキサ113aは、例えば水晶振動子等の基準周波数信号TCOXを受けて作動する周波数シンセサイザ119からの信号とアクセス信号を合成してRFフィルタ114aへ送出する。

【0035】RFフィルタ114aは、アクセス信号を例えば1.429GHz～1.453GHzにフィルタリングして増幅器115aへ送出する。増幅器115aは、アクセス信号を増幅して分波器122へ送出する。そして、分波器122は、アクセス信号を送信周波数に分波して送信用アンテナ121を介して基地局の留守録機能に送信する。

【0036】基地局の留守録機能は、留守録されているメッセージが有る場合、メッセージ有の信号を第2携帯端末装置100に送信する。第2携帯端末装置100の分波器122は、送信用アンテナ121を介して受信したメッセージ有の受信信号（以下、メッセージ信号という）を受信周波数に分波して増幅器115bへ送出する（ステップS4）。増幅器115bは、メッセージ信号を増幅してRFフィルタ114bへ送出する。RFフィルタ114bは、メッセージ信号を例えば1.477GHz～1.501GHzにフィルタリングしてミキサ113bへ送出する。ミキサ113bは、周波数シンセサイザ119からの信号とメッセージ信号を合成して第1IFフィルタ117aへ送出する。

【0037】第1IFフィルタ117aは、メッセージ信号を例えば243.95MHzまたは248.45MHzにフィルタリングして増幅器115cへ送出する。増幅器115cは、メッセージ信号を増幅しミキサ113cを介して第2IFフィルタ117bへ送出する。第2IFフィルタ117bは、メッセージ信号を例えば10.7MHzにフィルタリングして増幅器115dへ送出する。増幅器115dは、メッセージ信号を増幅して復調器118へ送出する。復調器118は、メッセージ信号をデジタル信号に変換して時分割多重回路111Bへ送出する。そして、時分割多重回路111Bは、メッセージ信号をメッセージ表示制御回路203及びタイマ204へ送出する。

【0038】メッセージ表示制御回路203は、時分割多重回路111Bからのメッセージ信号により、基地局の留守録機能に留守録されたメッセージが有る旨、例えば「留守録メッセージ有り」を表示部130の液晶ディスプレイ131に表示させる。同時に、タイマ204は、時分割多重回路111Bからのメッセージ信号により、設定時間のカウントダウンを開始する（ステップS

5, S6）。そして、受信者が基地局の留守録機能に手動アクセスした時点で設定時間のカウントダウンを停止する（ステップS7, S8）。

【0039】一方、設定時間を最後までカウントダウンした時点で受信者が基地局の留守録機能に手動アクセスしていない場合は、その旨の通知信号を報知回路205に送出する（ステップS7, S9）。報知回路205は、タイマ204からの通知により、パイプレータ160を駆動して第2携帯端末装置100を振動させ、あるいは音響入出力部140のスピーカ141から所定の警告音、例えば断続的な電子音や音声、例えば「留守録されたメッセージがあります」等を発生させ、受信者が基地局の留守録機能に手動アクセスしていないことを受信者に報知する（ステップS10）。

【0040】このような携帯端末装置100によれば、受信者が、自覚なしに通信圏外と通信圏内との間を出たり入ったりしている間にメッセージが留守録されていても、留守録機能に自動アクセスしてくれ、さらに、受信者が通信圏内に戻ってきても携帯端末装置に出られない場合は、留守録機能に留守録されたメッセージが有るか否かを確実に認識することができるので、メッセージに気が付かずに長期間放置された後に手動アクセスにより初めて気が付くような不具合を防止することができる。

【0041】尚、上述した実施形態では、携帯端末装置相互の通信について説明したが、携帯端末装置と一般電話との通信でも同様の効果を得ることができる。さらに、携帯端末装置として携帯電話を例に説明したが、PHS等の無線を利用した携帯端末装置であれば同様に適用することができる。また、携帯端末装置が電波の届かない場所に置かれる例として、携帯端末装置が携帯電話のときは地下街や地下鉄内、携帯端末装置がPHSのときは高速移動車両内等の通信圏外に置かれているときを想定しているが、例えば携帯端末装置の電源が切られているときも同様の効果を奏する。

【0042】さらに、基地局の留守録機能に留守録されているメッセージが有る場合にメッセージ有の報知を行うようにしたが、メッセージが無い場合にもメッセージ無の報知を行うようにしても良い。また、留守番電話サービス以外のサービスに対しても、同様の効果を奏するように適用することができる。

【0043】

【発明の効果】以上述べたように、本発明によれば、受信者が通信圏外から通信圏内に戻ってきたときに、受信者に留守録機能に留守録されたメッセージが有るか否かを確実に認識させることができるので、例えばメッセージの確認を長期間せずに放置して消去されてしまうようなことを防止することができる。

【図面の簡単な説明】

【図1】本発明の携帯端末装置の実施形態を示す概略図

ロック図である。

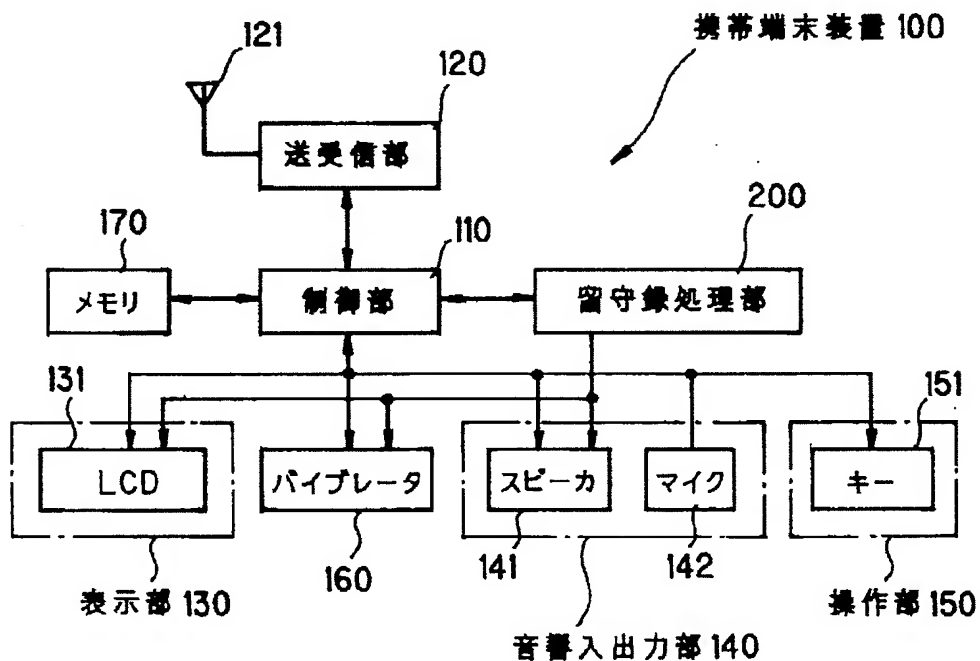
【図 2】図 1 に示す携帯端末装置の主要部である留守録処理部及びこの留守録処理部の処理に関係する各部の詳細構成例を示すブロック図である。

【図 3】図 1 に示す携帯端末装置の動作例を示すフローチャートである。

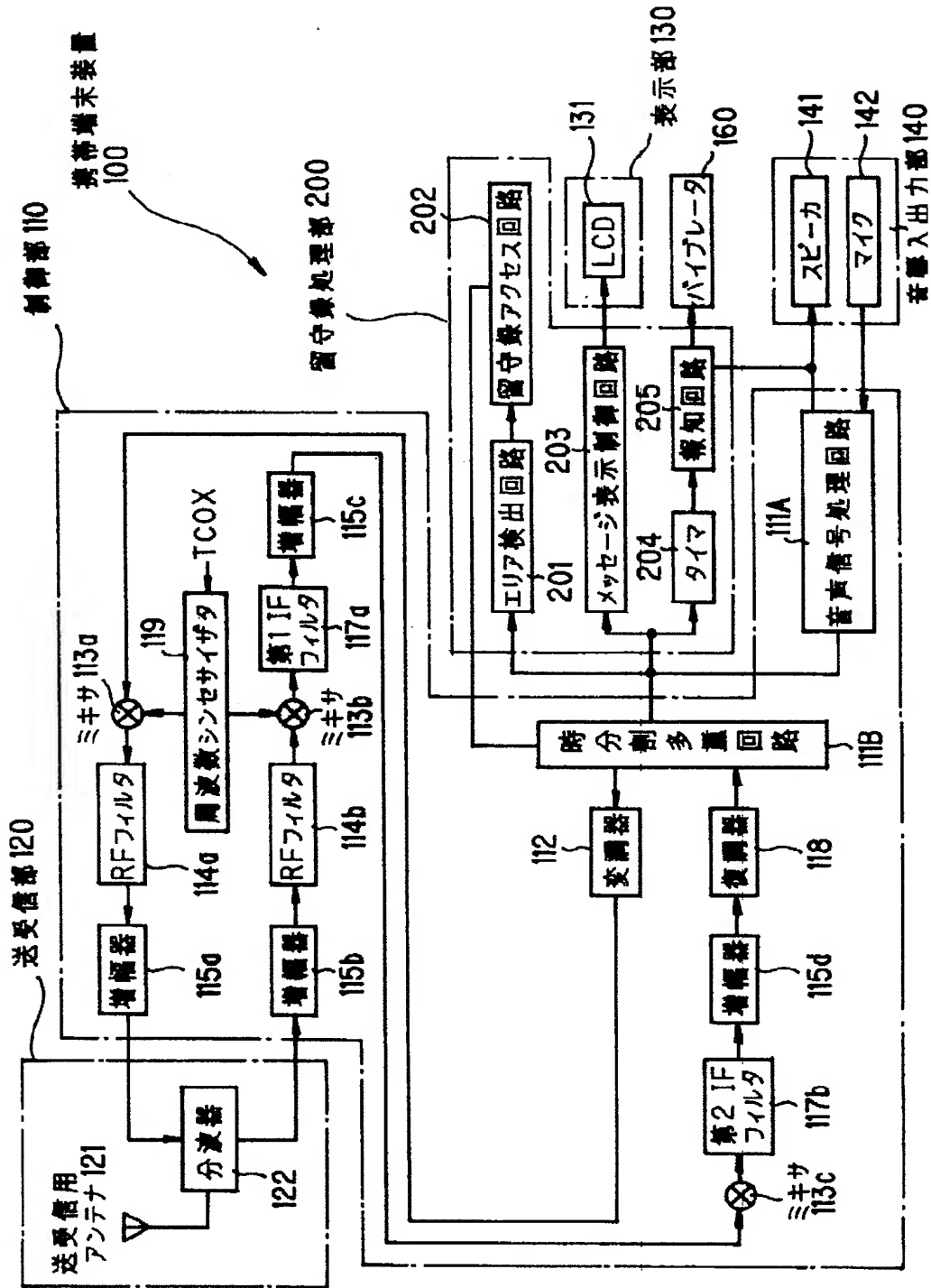
【符号の説明】

100	携帯端末装置	170	メモリ
110	制御部	200	留守録処理部
120	送受信部	111A	音声信号処理回路
130	表示部	111B	時分割多重回路
140	音響入出力部	121	送受信用アンテナ
150	操作部	122	分波器
160	パイプレータ	141	スピーカ
		142	マイク
		201	エリア検出回路
		202	留守録アクセス回路
		203	メッセージ表示制御回路
		204	タイマ
		205	報知回路

【図 1】



【図2】



【図3】

